CLAIMS

What is claimed is:

1. A method comprising:

creating an atomic data storage unit containing a first type of data requiring a first type of processing and a second type of data requiring a second type of processing; and

transferring the first type of data to a first memory address space via a direct memory access operation and transferring the second type of data to a second memory address space via the direct memory access operation.

2. The method of claim 1 wherein the atomic data storage unit is a physical data storage parcel created by mapping a plurality of virtual logical data storage blocks of a virtual data storage parcel to a plurality of physical logical data storage blocks of the physical data storage parcel, the virtual logical blocks of a first size and the physical logical blocks of a second size.

3. The method of claim 2 wherein the first type of data is system data contained in a parcel data field and the second type of data is parameter data contained in a parcel parameter field.

4. The method of claim 3 wherein the first memory address space is a cache memory of a host processing system.

5. The method of claim 3 wherein the first type of processing consists of data validation.

6. The method of claim 3 wherein the parcel parameter field contains parcel-level redundancy data.

7. The method of claim 6 wherein the parcel-level redundancy data is selected from the group consisting of an error correction code, a checksum and a cyclic redundancy code.

8. The method of claim 1 wherein the second type of processing includes software manipulation of the second type of data.

9. The method of claim 2 wherein the virtual data storage parcel includes eight virtual logical data blocks, the eight virtual logical data blocks mapped to a physical data storage parcel including nine physical logical data storage blocks.

10. The method of claim 9 wherein the nine physical logical data blocks are 512 bytes in length.

11. The method of claim 10 wherein the size of each virtual logical data block varies within a data storage system.

12. The method of claim 3 further comprising:

initializing a direct memory access engine with a first set of initialization parameters specifying a memory address, a count and a size for each parcel data field and a second set of initialization parameters specifying a memory address, a count and a size for each parcel parameter field.

13. The method of claim 12 wherein the size of each parcel data field and the size of each parcel parameter field is fixed for a scope of the direct memory access operation.

14. A data storage system comprising:

a storage medium having stored thereon a plurality of atomic data storage units containing a first type of data requiring a first type of processing and a second type of data requiring a second type of processing; and

a direct memory access controller coupled to the storage medium configured to transfer the first type of data to a first memory address space via a direct memory access operation and transfer the second type of data to a second memory address space via the direct memory access operation.

15. The data storage system of claim 14 wherein the atomic data storage unit is a physical data storage parcel created by mapping a plurality of virtual logical data storage blocks of a virtual data storage parcel to a plurality of physical logical data storage blocks of the physical data storage parcel, the virtual logical blocks of a first size and the physical logical blocks of a second size.

16. The data storage system of claim 15 wherein the first type of data is system data contained in a parcel data field and the second type of data is parameter data contained in a parcel parameter field.

17. The data storage system of claim 16 wherein the first memory address space is a cache memory of a host processing system.

18. The data storage system of claim 16 wherein the first type of processing consists of data validation.

19. The data storage system of claim 16 wherein the parcel parameter field contains parcel-level redundancy data.

20. The data storage system of claim 19 wherein the parcel-level redundancy data is selected from the group consisting of an error correction code, a checksum and a cyclic redundancy code.

21. The data storage system of claim 14 wherein the second type of processing includes software manipulation of the second type of data.

22. The data storage system of claim 15 wherein the virtual data storage parcel includes eight virtual logical data blocks, the eight virtual logical data blocks mapped to a physical data storage parcel including nine physical logical data storage blocks.

23. The data storage system of claim 22 wherein the nine physical logical data blocks are 512 bytes in length.

24. The data storage system of claim 23 wherein the size of each virtual logical data block varies within a data storage system.

25. The data storage system of claim 16 wherein the direct memory access controller is initialized with a first set of initialization parameters specifying a memory address, a count and a size for each parcel data field and a second set of initialization parameters specifying a memory address, a count and a size for each parcel parameter field.

26. The data storage system of claim 25 wherein the size of each parcel data field and the size of each parcel parameter field is fixed for a scope of the direct memory access operation.

27. An apparatus comprising:

means for creating an atomic data storage unit containing a first type of data requiring a first type of processing and a second type of data requiring a second type of processing; and

means for transferring the first type of data to a first memory address space via a direct memory access operation and transferring the second type of data to a second memory address space via the direct memory access operation.

28. The apparatus of claim 27 wherein the atomic data storage unit is a physical data storage parcel created by mapping a plurality of virtual logical data storage blocks of a virtual data storage parcel to a plurality of physical logical data storage blocks of the physical data storage parcel, the virtual logical blocks of a first size and the physical logical blocks of a second size.

29. The apparatus of claim 28 wherein the first type of data is system data contained in a parcel data field and the second type of data is parameter data contained in a parcel parameter field.

30. The apparatus of claim 29 wherein the first memory address space is a cache memory of a host processing system.

31. The apparatus of claim 29 wherein the first type of processing consists of data validation.

32. The apparatus of claim 29 wherein the parcel parameter field contains parcel-level redundancy data.

33. The apparatus of claim 32 wherein the parcel-level redundancy data is selected from the group consisting of an error correction code, a checksum and a cyclic redundancy code.

34. The apparatus of claim 27 wherein the second type of processing includes software manipulation of the second type of data.

35. The apparatus of claim 28 wherein the virtual data storage parcel includes eight virtual logical data blocks, the eight virtual logical data blocks mapped to a physical data storage parcel including nine physical logical data storage blocks.

36. The apparatus of claim 35 wherein the nine physical logical data blocks are 512 bytes in length.

37. The apparatus of claim 36 wherein the size of each virtual logical data block varies within a data storage system.

38. The apparatus of claim 29 further comprising:

means for initializing a direct memory access engine with a first set of initialization parameters specifying a memory address, a count and a size for each parcel data field and a second set of initialization parameters specifying a memory address, a count and a size for each parcel parameter field.

39. The apparatus of claim 38 wherein the size of each parcel data field and the size of each parcel parameter field is fixed for a scope of the direct memory access operation.